

# Human Health & Diseases

Health is a state of complete physical, mental and social well being not merely an absence of disease or physical fitness.

**Good Humor Hypothesis** by-Hippocrates (Greek) & Indian Ayurveda system

'Health is a state of body and mind where there was a balance of certain 'humors' (fluid).'

Persons with 'blackbile' belonged to hot personality and would have fevers.



Four types of humours

William Harvey disproved the 'good humor' hypothesis by demonstrating normal body temperature in persons with blackbile using thermometer.

Mind influences, through neural system and endocrine system & our immune system. Health is affected by-

- Genetic disorders – the defect which child inherits from its parents.
- Infection
- Lifestyle- includes food and water we take, exercise and rest etc.

**Que: What one should do to achieving good Health? What are the benefits of a healthy lifestyle?**

**Ans:** One should do the following things:

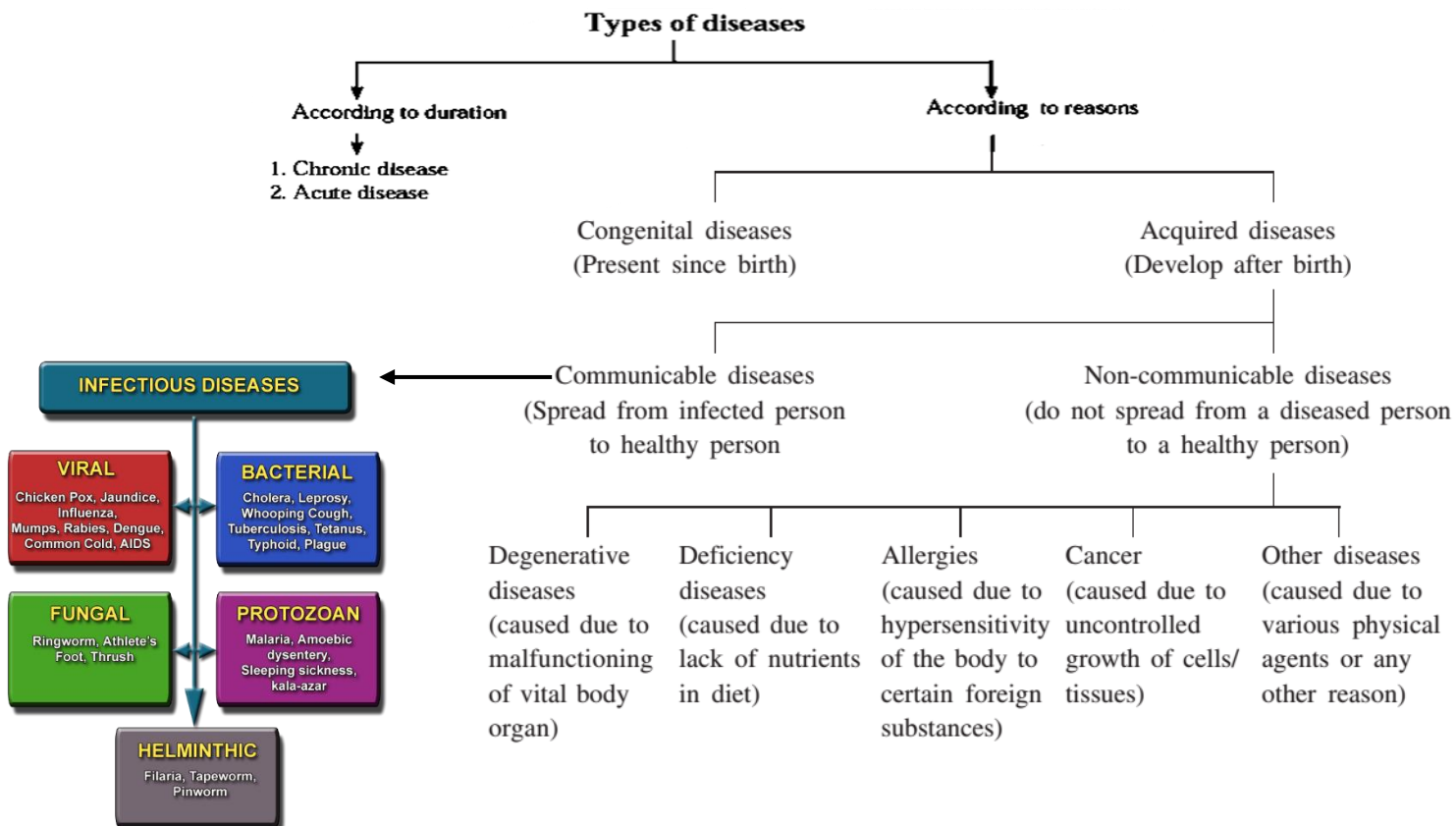
- Take proper Balanced diet
- Maintain personal, food & water hygiene
- Regular exercise
- Yoga (for physical and mental health).
- Should be Awareness about diseases and their effects
- Vaccination (immunisation)
- Proper disposal of wastes
- Control of vectors

Benefits of a healthy lifestyle:

- More efficient at work.
- Increases productivity.
- Economic prosperity
- Longevity of Life.
- Reduces infant and maternal mortality

**Que: What is Disease?**

**Ans:** Un-easiness of the body, when the functioning of one or more organs or systems of the body is adversely affected, characterised by various signs and symptoms.



Acute Diseases	Chronic Diseases
Occur suddenly.	Occur over a prolonged period.
Last for a shorter period.	Last longer, even for a lifetime.
Cause sudden & short-term damage to the body.	Cause long term damage to the patient.
Onset is sudden and often treatable.	Progress gradually and usually end up causing long term damage.
E.g. Typhoid, bone fracture, cholera, common cold, jaundice, malaria, etc.	Eg. Diabetes, cancer, tuberculosis, arthritis, etc.

Congenital disease	Acquired disease
Present since birth	Acquired during once lifetime by the external environment.
Transmitted through defected genes of the parents or a defect in the intrauterine environment of the mother.	Transmitted via pathogenic organisms like bacteria, virus, fungi, protozoa, etc or by environmental pollutants, failure of organ, deficiency etc.
Ex: Haemophilia, Sickle cell anaemia etc	Ex: Cholera, Common cold, arsenic poisoning, skin cancer etc

INFECTIOUS DISEASES	NON-INFECTIOUS DISEASES
1. Caused due to attack of pathogens	1. Caused by factors other than pathogens
2. Caused due to extrinsic factors	2. Caused due to intrinsic factors
3. Transmitted from one person to another	3. Do not get transmitted from one person to another
4. Transmission of diseases occurs through direct contact or some medium (air, water, vectors)	4. Transmission in case of hereditary diseases is from parent to offspring
5. Community hygiene can reduce the occurrence of these diseases	5. Community hygiene is ineffective in reducing the occurrence of these diseases
E.g. Cholera, Malaria	E.g. Diabetes, Goitre

**Que: What are congenital disease? Give few examples.**

**Ans:** The genetic disease or a disorder that is inherited genetically and is present from birth in an individual. Eg:

- Albinism
- Haemophilia
- Huntington's disease

**Que: What are degenerative diseases? Give few examples.**

**Ans:** Disease caused by malfunctioning of vital organs in the body due to the deterioration of cells over time/age. Ex: Organ failure (Kidney, liver Heart etc)

Alzheimer's	Brain cell connections and the cells themselves degenerate and die, eventually destroying memory and other important mental functions.
Osteoporosis	Mineral density and bone mass decreases, result in decrease bone strength and increase risk of fracture.
Parkinson's Disease	Nerve cells in the basal ganglia, area of brain that controls movement, become impaired and/or die, results in uncontrolled movement such as shaking, stiffness etc.
Arthritis	The wearing down of the protective tissue at the ends of bones (cartilage) occurs gradually and worsens over time result in joint inflammation.
Huntington's disease	An inherited disorder that causes nerve cells (neurons) in parts of the brain to gradually break down and die.

**What are pathogens? How does the affect humans?**

**Ans:** Pathogens are microorganisms that have the potential to cause infectious diseases. Eg: Viruses, bacteria, protozoans, fungi, worms etc.

They enter our body by various means, multiply and interfere with normal vital activities, resulting in morphological and functional damage. Pathogens have to adapt to life within the host such as surviving at low pH in stomach and resisting the various digestive enzymes.

Vitamin	Diseases and their symptoms
A (Retinol)	poor vision, night-blindness
B <sub>1</sub> (Thiamine)	extreme weakness, beri-beri
B <sub>2</sub> (Riboflavin)	retarded growth, bad skin
B <sub>12</sub> (Cyanocobalamin)	anaemia
C (Ascorbic acid)	scurvy, swollen gums, loose teeth
D (Calciferol)	rickets, brittle bones in children which break or bend easily
K (Phylloquinone)	excessive bleeding due to injury
Diseases Caused due to Deficiency	
Name of minerals	Diseases and their symptoms
Calcium	brittle bones, excessive bleeding, bad muscular movement
Phosphorus	bad teeth and bones
Iron	anaemia, lack of red blood cells
Iodine	goitre, enlarged thyroid gland
Copper	low appetite, retarded growth

## Bacterial Diseases

<b>Typhoid</b>	<b>Pathogen:</b>	Salmonella typhi	<b>Test:</b>	Widal Test
<b>Mode of Transmission:</b>	Food & Contaminated Water		<b>Affected Organ:</b>	Small Intestine
<b>Symptoms</b>	High Fever (39° to 40° C), weakness, stomach pain, constipation, headache & loss of appetite. Intestinal perforation & death in severe cases.			
<b>Special Case:</b>	Mary Mallon or Typhoid Mary was a cook who continued to spread typhoid for several years the food she cooked.			

<b>Pneumonia</b>	<b>Pathogen:</b>	Streptococcus pneumonia, Haemophilus influenzae	<b>Test:</b>	X-ray or CBC
<b>Mode of Transmission:</b>	Inhaling droplets/aerosols, sharing utensils		<b>Affected Organ:</b>	Alveoli of lungs
<b>Symptoms</b>	Alveoli filled with fluid result in respiratory problems like cough, chills, fever & headache. Lips & finger nails turns gray to bluish due to lack of oxygen (reduced alveoli surface area)			

<b>Tuberculosis</b>	<b>Pathogen:</b>	Mycobacterium tuberculosis	<b>Test:</b>	Mantoux test
<b>Mode of Transmission:</b>	Inhaling droplets/aerosols		<b>Affected Organ:</b>	Lungs
<b>Symptoms</b>	Cough, Fever, Mucus with Blood, weight loss.			

<b>Dysentery</b>	<b>Pathogen:</b>	Escherichia coli	<b>Test:</b>	Stool test
<b>Mode of Transmission:</b>	Poor hygiene and sanitation.		<b>Affected Organ:</b>	Small Intestine
<b>Symptoms</b>	Severe diarrhea, fever, stomach pain, nausea and vomiting.			

<b>Plague</b>	<b>Pathogen:</b>	Yersinia pestis.	<b>Vector:</b>	Rat
<b>Mode of Transmission:</b>	Bitten by a rodent (Rat) carrying bacteria		<b>Affected Organ:</b>	Lymph nodes & Lungs
<b>Symptoms</b>	Fever, chills, extreme weakness, abdominal pain, shock, and possibly bleeding into the skin and other organs. Skin and other tissues may turn black and die.			

<b>Diarrhoea</b>	<b>Pathogen:</b>	E.coli, Shigella Bacteria		
<b>Mode of Transmission:</b>	Contaminated food & water		<b>Affected Organ:</b>	Small Intestine
<b>Symptoms</b>	Frequent loose & watery stool, nausea, vomiting, fever, loss of appetite, stomach pain, weight loss, dehydration.			

<b>Cholera</b>	<b>Pathogen:</b>	Vibrio cholerae		
<b>Mode of Transmission:</b>	Contaminated food & water and housefly		<b>Affected Organ:</b>	Small Intestine
<b>Symptoms</b>	Watery diarrhoea, vomiting, nausea dehydration.			

<b>Diphtheria</b>	<b>Pathogen:</b>	Corynebacterium diphtheriae		
<b>Mode of Transmission:</b>	Coughing, sneezing or touching infected open sores		<b>Affected Organ:</b>	Nose and throat
<b>Symptoms</b>	Sore throat, fever, swollen lymph nodes, Difficulty breathing, Nasal discharge & weakness.			

<b>Pertussis /Woofing Cough</b>	<b>Pathogen:</b>	Bordetella pertussis bacteria		
<b>Mode of Transmission:</b>	By droplets (coughs or sneezes), saliva , skin-to-skin contact (handshakes or hugs).		<b>Affected Organ:</b>	Respiratory tract
<b>Symptoms</b>	Cough that sounds like "whoop" and runny nose, nasal congestion, sneezing.			

<b>Tetanus (Lock Jaw)</b>	<b>Pathogen:</b>	Clostridium tetani		
<b>Mode of Transmission:</b>	soil, dust, manure, contaminated objects etc		<b>Affected Organ:</b>	Muscles (specially Jaw)
<b>Symptoms</b>	Painful muscle contraction, causes neck & jaw muscles to lock			

## Viral Diseases

<b>Common Cold</b>	<b>Pathogen:</b>	Rhino Virus	<b>Window (Incubation) Period</b>	3-7 days
<b>Mode of Transmission:</b>	Inhaling droplets/aerosols, contaminated utensils		<b>Affected Organ:</b>	Nose & Respiratory Passage
<b>Symptoms</b>	Nasal congestion and discharge, sore throat, hoarseness, cough, headache, tiredness, etc.			

<b>Chikungunya</b>	<b>Pathogen:</b>	Chikungunya virus	<b>Vector</b>	Aedes Mosquito
<b>Mode of Transmission:</b>	Mosquito bite		<b>Affected Organ:</b>	brain, heart, lungs, kidneys, skin, and joints.
<b>Symptoms</b>	Joint Pain, Fever, Joint swelling, Muscle Pain, Head ache, Nausea, Fatigue, Rash			

<b>Dengue</b>	<b>Pathogen:</b>	Dengue virus (Flaviviridae family)	<b>Vector</b>	Aedes aegypti Mosquito
<b>Mode of Transmission:</b>	Mosquito bite		<b>Affected Organ:</b>	Liver
<b>Symptoms</b>	High fever, headache, body aches, nausea rash , muscle and joint pain. In severe cases there is serious internal bleeding (because of low platelets)			

<b>Mumps</b>	<b>Pathogen:</b>	Paramyxovirus (RNA Virus)		
<b>Mode of Transmission:</b>	Inhaling droplets/aerosols, direct contact		<b>Affected Organ:</b>	Salivary (parotid) glands
<b>Symptoms</b>	Painful swelling behind ear, inflammation of parathyroid gland, high fever, difficulty in jaw movement etc.			

Measles	Pathogen:	Morbillivirus / Paramyxovirus (RNA Virus)
Mode of Transmission:	Inhaling droplets, direct contact	
Symptoms	Fever, Cold, headache, rashes all over skin etc.	

Chicken Pox	Pathogen:	varicella-zoster virus		
Mode of Transmission:	Inhaling droplets, direct contact			
Symptoms	High Fever, headache, itchininess blisters or rashes all over skin etc.			

## Helminths (Worm) Diseases

<b>Ascaris</b>	<b>Pathogen:</b>	common round worm and Wuchereria, the filarial worm,		
<b>Mode of Transmission:</b>	Contaminated food & water by the eggs of parasite along with the faeces of infected persons which contaminate soil, water, plants, etc.		<b>Affected Organ:</b>	Large Intestine
<b>Symptoms</b>	Internal bleeding, muscular pain, fever, anemia and blockage of the intestinal passage.			

<b>Elephantiasis or filariasis</b>	<b>Pathogen:</b>	Wuchereria (W. bancrofti and W. malayi), the filarial worms	<b>Vector</b>	Female Anopheles Mosquito
<b>Mode of Transmission:</b>	Contaminated food & water by Transmission of parasite from faeces of infected person		<b>Affected Organ:</b>	lymphatic vessels of the lower limbs
<b>Symptoms</b>	gross deformities of lower limb and genital organs are also often affected			

## Fungal Disease

<b>Ring Worm</b>	<b>Pathogen:</b>	Microsporum, Trichophyton and Epidermophyton	<b>Condition for Growth</b>	Heat & Moisture
<b>Mode of Transmission:</b>	From soil or by using towels, clothes or even the comb		<b>Affected Organ:</b>	Skin, nail and scalp. Skin folds - groin or between the toes.
<b>Symptoms</b>	Appearance of dry, scaly lesions on various part of body & intense itching.			

## Protozoan Disease

<b>Amoebic Dysentery</b>	<b>Pathogen:</b> Entamoeba histolytica	<b>Vector</b>	House fly
<b>Mode of Transmission:</b>	Contaminated food & water by Transmission of parasite from <b>faeces of infected</b> person	<b>Affected Organ:</b>	<b>Large Intestine</b>
<b>Symptoms</b>	Constipation, abdominal pain and cramps, stools with excess mucous and blood clots etc.		

<b>Malaria</b>	<b>Pathogen:</b> Plasmodium (P. vivax, P. malaria and <b>P. falciparum</b> (malignant & fatal))	<b>Vector</b>	<b>Female Anopheles Mosquito</b>
<b>Mode of Transmission:</b>	Bite of female anopheles mosquito	<b>Affected Organ:</b>	<b>Liver, Spleen &amp; Kidney</b>
<b>Symptoms</b>	Chill and high fever recurring every three to four days.		

### Liver (Human)

- Plasmodium Reproduce Asexually
- RBCs (human)**
- Plasmodium Reproduce Asexually and rupture RBCs
- Ruptured RBCs release **Hemozoin**- Chemical that causes chills
- In infected RBCs Plasmodium **reproduce Sexually** (forms gametes)

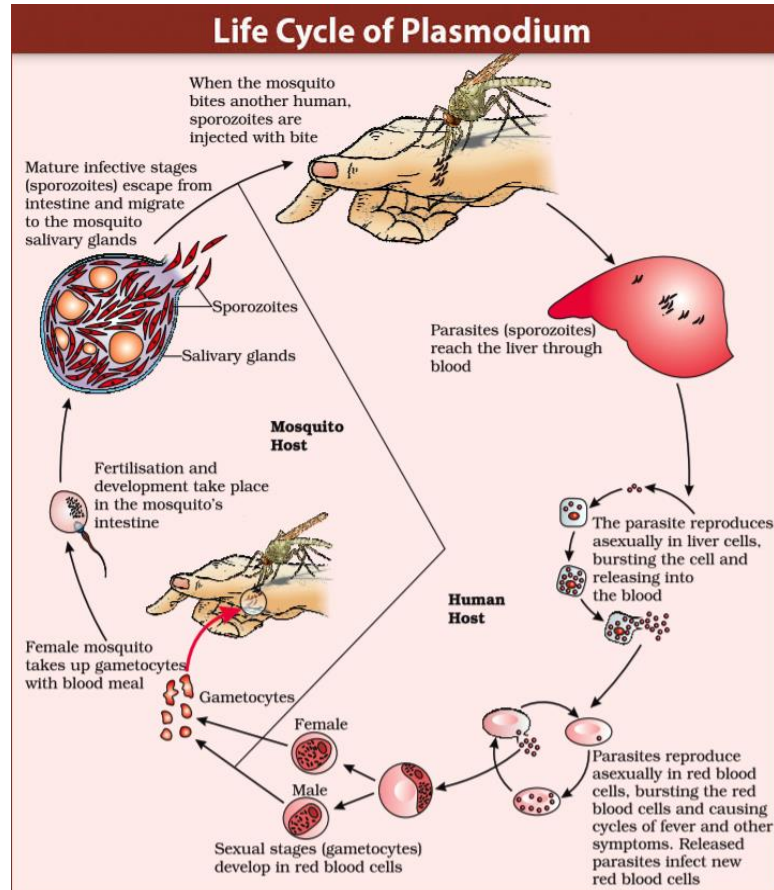
### Intestine (Female Anopheles Mosquito)

- Fertilization takes place in Gut.
- Salivary Glands (Female Anopheles Mosquito)**
- Sporozoites Stored

### How can we prevent vector borne diseases?

Disease can be prevented by control or eliminate the vectors and their breeding places by:

- Avoiding stagnant water around residential areas.
- Regular cleaning of household coolers.
- Use of mosquito nets.
- Introducing **fishes like Gambusia in ponds that feed on mosquito larvae.**
- Spraying of insecticides in ditches, drainage areas and swamps, etc.
- Doors and windows should be provided with wire mesh to prevent the entry of mosquitoes



### Differentiate between Personal and public hygiene.

Personal Hygiene	Public Hygiene
Keeping the body clean (Skin, nails, hairs etc)	Proper disposal of waste and excreta
Consumption of clean drinking water & food.	Periodic cleaning and disinfection of water reservoirs, pools, cesspools and tanks
Washing or sanitising hands regularly	Observing standard practices of hygiene in public catering
Washing vegetables & fruits thoroughly before eating.	Preventing Stagnant water in surroundings.